No. 9600095

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

Holden's Foundation Seeds, Inc.

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED, PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSES, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. (84 STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'LH178'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the **Plant Variety Protection Office** *to be affixed at the City of Washington, D.C. this thirty-first day of October in the year of our Lord one thousand nine hundred and ninety-seven.*

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY. *Include form number and date on all reproductions.* FORM APPROVED - OMB NO. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE DIVISION - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a).

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) *(as it is to appear on the Certificate)*
HOLDEN'S FOUNDATION SEEDS, INC.

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER
Ex3509

3. VARIETY NAME
LH178

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
201 N. MAPLEWOOD AVENUE
PO BOX 839
WILLIAMSBURG, IA 52361

6. TELEPHONE *(include area code)*
(319)668-1100

6. FAX *(include area code)*
(319)668-2453

FOR OFFICIAL USE ONLY

PVPO NUMBER
9600095

FILING DATE
Jan. 5, 1996

FEES RECEIVED
FILING AND EXAMINATION FEE:
$ 2450.00
DATE
1/4/96
CERTIFICATION FEE:
$ 300.00
DATE
Sept. 23, 1997

7. GENUS AND SPECIES NAME
ZEA MAYS

8. FAMILY NAME *(Botanical)*
GRAMINEAE

9. CROP KIND NAME *(Common name)*
CORN, FIELD

10. IF THE APPLICANT NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.) (Common name)*
CORPORATION

11. IF INCORPORATED, GIVE STATE OF INCORPORATION
IOWA

JMS 6/23/97

12. DATE OF INCORPORATION
1/2/1968

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS
MR. MARK ARMSTRONG
HOLDEN'S FOUNDATION SEEDS, INC.
201 N. MAPLEWOOD AVENUE
PO BOX 839
WILLIAMSBURG, IA 52361

14. TELEPHONE *(include area code)*
(319)668-1100

15. FAX *(include area code)*
(319)668-2453

16. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED *(Follow instructions on reverse)*

a. [X] Exhibit A. Origin and Breeding History of the Variety
b. [X] Exhibit B. Statement of Distinctness
c. [X] Exhibit C. Objective Description of the Variety
d. [X] Exhibit D. Additional Description of the Variety
e. [X] Exhibit E. Statement of the Basis of the Applicant's Ownership
f. [X] Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties verification that tissue culture will be deposited and maintained in a public repository)*
g. [X] Filing and Examination Fee ($2,460), made payable to "Treasurer of the United States" *(Mail to PVPO)*

17. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY, AS A CLASS OF CERTIFIED SEED? *(See Section 83(a) of the Plant Variety Protection Act)?*
[ ] YES *(If "yes," answer items 18 and 19 below)* [X] NO *(If "no," go to item 20)*

18. DOES THE APPLICANT SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?
[ ] YES [ ] NO

19. IF "YES" TO ITEM 18, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?
[ ] FOUNDATION [ ] REGISTERED [ ] CERTIFIED

20. HAS THE VARIETY OR A HYBRID PRODUCED FROM THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETED IN THE U.S. OR OTHER COUNTRIES?
[ ] YES *(If "yes," give names of countries and dates)* [X] NO

21. The applicant(s) declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned applicant(s) is(are) the owner(s) of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 41, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Applicant(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT *(Owner(s))*		SIGNATURE OF APPLICANT *(Owner(s))*	
Ronald Holden			
NAME *(Please print or type)*		NAME *(Please print or type)*	
RONALD HOLDEN			
CAPACITY OR TITLE	DATE	CAPACITY OR TITLE	DATE
PRESIDENT	1/2/96		

9600095

Origin and Breeding History of the Inbred

Exhibit A

Before the development of LH178 was initiated, the single cross LH85 x LH61 was crossed with LH82. This combination, LH85 x LH61) (LH82 was then selfed and the pedigree system of plant breeding was then used in the development of LH178. Yield, stalk quality, root quality, disease tolerance, late plant greenness, late plant intactness, ear retention, pollen shedding ability, silking ability and corn borer tolerance were the criteria used to determine the rows from which ears were selected.

LH85, LH61 and LH82 the progenitors of LH178, are all proprietary field corn inbred lines developed and owned by Holden's Foundation Seeds, Inc. of Williamsburg, Iowa. In 1987, Holden's Foundation Seeds, Inc. applied for plant variety protection of LH85 and LH61. LH85 and LH61 were awarded certificates #8700088 and #8700137 on March 31, 1988 and March 11, 1988 respectively. In 1984, Holden's Foundation Seeds, Inc. applied for plant variety protection of LH82 and was awarded certificate #88500037 on July 26,1985.

On the following pages are a summary and description of the development of LH178. Also included are copies of pages from Holden's Foundation Seeds, Inc. nursery books. The rows associated with the development of LH178 have been highlighted.

Attached is a statement from David C. Harper II, PhD. of Holden's Foundation Seeds, Inc. stating that the line is stable, uniform and free of variance.

Origin and Breeding History of the Inbred LH178 = Ex3509 = LH85 x LH61)(LH82

Exhibit A

Row/Field	Pedigree	Location	Year
North McCune	LH178	Iowa	1995
20 AS	LH178	Hawaii	1995
18025-18034	Ex3509	Iowa	1994
11058	LH85 x LH61)(LH82 @7	Iowa	1993
15807	LH85 x LH61)(LH82 @7	Iowa	1992
29367	LH85 x LH61)(LH82 @6	Hawaii	1992
30341	LH85 x LH61)(LH82 @5	Iowa	1991
31428	LH85 x LH61)(LH82 @4	Hawaii	1991
26756	LH85 x LH61)(LH82 @3	Iowa	1990
27655	LH85 x LH61)(LH82 @2	Hawaii	1990
13326	LH85 x LH61)(LH82 @1	Hawaii	1989
31745	LH85 x LH61)(LH82	Hawaii	1989
36748 36550	LH85 x LH61 LH82	Iowa	1988
34399 34377	LH85 LH61	Iowa	1987

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Uniformity Statement

Exhibit A

I have observed LH178 during the last five generations it has been increased: 1992 Iowa nursery row 15807; 1993 Iowa nursery row 11058; 1994 Iowa nursery rows 18025-18034; 1995 Hawaii production field #20 AS; and 1995 Iowa production North McCune field. In each of these increases, seeds from the previous generation were planted. LH178 is stable and uniform. The inbred line is also free of variance from within the population.

David C. Harper II

David C. Harper II, PhD.
Plant Breeder
Holden's Foundation Seeds, Inc.

9600095

Novelty Statement

Exhibit B

LH178 is most similar to LH82. However, the most distinguishing difference is leaf color. LH178 is darker green in leaf color than LH82. When using Munsell Color Charts for Plant Tissues as a reference, LH178 would be classified as 5GY 4/4 and LH82 would be classified as 5GY 6/4.

The anther color of LH178 is yellow (2.5Y8/6) while the anther color of LH82 is pink (5RP 7/6).

FORM SD-470-28
(9-1-92)

EXHIBIT C
(Corn; Maize)

United States Department of Agriculture, Agricultural Marketing Service
Science Division, Plant Variety Protection Office
National Agricultural Library Building, Room 500
Beltsville, MD 20705

OBJECTIVE DESCRIPTION OF VARIETY
CORN (*Zea mays* L.)

Name of Applicant(s)	Variety Seed Source	Variety Name or Temporary Designation
HOLDEN'S FOUNDATION SEEDS, INC.	IOWA 1995	LH178

Address (Street & No., or R.F.D. No., City, State, Zip Code and Country)
201 N. MAPLEWOOD AVENUE, PO BOX 839
WILLIAMSBURG, IA 52361

FOR OFFICIAL USE

PVPO Number 9600095

Place the appropriate number that describes the varietal characters typical of this inbred variety in the spaces below. Right justify whole numbers by adding leading zeroes if necessary. Completeness should be striven for to establish an adequate variety description. Traits designated by a '*' are considered necessary for an adequate variety description and must be completed.

COLOR CHOICES (Use in conjunction with Munsell color code to describe all color choices; describe #25 and #26 in Comments section):

01=Light Green	06=Pale Yellow	11=Pink	16=Pale Purple	21=Buff
02=Medium Green	07=Yellow	12=Light Red	17=Purple	22=Tan
03=Dark Green	08=Yellow-Orange	13=Cherry Red	18=Colorless	23=Brown
04=Very Dark Green	09=Salmon	14=Red	19=White	24=Bronze
05=Green-Yellow	10=Pink-Orange	15=Red & White	20=White Capped	25=Variegated (Describe)
				26=Other (Describe)

STANDARD INBRED CHOICES (Use the **most similar** (in background and maturity) of these to make comparisons based on **grow-out trial** data):

Yellow Dent Families:

Family	Members
B14	CM105, A632, B64, B68
B37	B37, B76, H84
B73	N192, A679, B73, NC268
C103	Mo17, Va102, Va35, A682
Oh43	A619, MS71, H99, Va26
WF9	W64A, A554, A654, Pa91

Yellow Dent (Unrelated):
Co109, ND246,
Oh7, T232
W117, W153R
W182BN

White Dent:
CI66, H105, Ky228

Sweet Corn:
C13, Iowa5125, P39, 2132

Popcorn:
SG1533, 4722, HP301, HP7211

Pipecorn:
Mo15W, Mo16W, Mo24W

1. TYPE: (describe intermediate types in Comments section)

* 2 1=Sweet 2=Dent 3=Flint 4=Flour 5=Pop 6=Ornamental 7=Pipecorn

Standard Inbred Name A654

2

2. REGION WHERE DEVELOPED IN THE U.S.A.:

* 2 1=Northwest 2=Northcentral 3=Northeast 4=Southeast 5=Southcentral 6=Southwest 7=Other _____

Standard Seed Source IOWA STATE UNIVERSITY

2

3. MATURITY (In Region Best Adaptability; show Heat Unit formula in "Comments" section):

	DAYS	HEAT UNITS		DAYS	HEAT UNITS
*	74	1285.0	From emergence to 50% of plants in silk	68	1125.5
*	74	1285.0	From emergence to 50% of plants in pollen	69	1157.0
			From 10% to 90% pollen shed		
(*)			From 50% silk to optimum edible quality		
			From 50% silk to harvest at 25% moisture		

4. PLANT:

	Standard Deviation	Sample Size		Standard Deviation	Sample Size
* 171.2 cm Plant Height (to tassel tip)	10.73	50	153.8	13.08	50
* 71.2 cm Ear Height (to base of top ear node)	11.15	50	58.5	6.56	50
12.3 cm Length of Top Ear Internode	1.50	50	12.6	1.74	50
0.0 Average Number of Tillers	0	50	0.0	0	50
* 1.2 Average Number of Ears per Stalk	.5	50	1.0	0	50

1 Anthocyanin of Brace Roots: 1=Absent 2=Faint 3=Moderate 4=Dark

3

3/15 7/1/97

Application Variety Data	Page 2		Standard Inbred Data 9600095		
5. LEAF:	Standard Deviation	Sample Size		Standard Deviation	Sample Size
* 9.5 cm Width of Ear Node Leaf	.69	50	8.9	.65	50
* 63.6 cm Length of Ear Node Leaf	4.02	50	59.3	3.46	50
* 5 Number of leaves above top ear	.48	50	4	.49	50
34 degrees Leaf Angle (measure from 2nd leaf above ear at anthesis to stalk above leaf)	5.47	50	28	6.28	50
* 02 Leaf Color (Munsell code 5GY 4/4)			01 (Munsell code 5GY 5/4)		
2 Leaf Sheath Pubescence (Rate on scale from 1=none to 9=like peach fuzz)			5		
3 Marginal Waves (Rate on scale from 1=none to 9=many)			3		
3 Longitudinal Creases (Rate on scale from 1=none to 9=many)			3		
6. TASSEL:	Standard Deviation	Sample Size		Standard Deviation	Sample Size
* 9 Number of Primary Lateral Branches	2.24	50	7	1.37	50
33 Branch Angle from Central Spike	13.31	50	26	8.06	50
* 37.8 cm Tassel Length (from top leaf collar to tassel tip)	4.29	50	34.8	3.87	50
7 Pollen Shed (Rate on scale from 0=male sterile to 9=heavy shed)			7		
07 Anther Color (Munsell code 2.5Y 8/6 *WITH BROWN MARGIN)			07 (Munsell code 2.5GY 8/6 *WITH BROWN MARGIN)		
02 Glume Color (Munsell code 5GY 4/4)			02 (Munsell code 5GY 5/4)		
1 Bar Glumes (Glume Bands): 1=Absent 2=Present			1		
7a. EAR (Unhusked Data):					
* 01 Silk Color (3 days after emergence) (Munsell code 2.5GY 8/6)			14 ~~01~~ (Munsell code 5R 5/6 ~~2.5GY 8/6~~)		
01 Fresh Husk Color (25 days after 50% silking) (Munsell code 2.5GY 7/6)			01 (Munsell code 2.5GY 7/6)		
21 Dry Husk Color (65 days after 50% Silking) (Munsell code 7.5YR 7/4)			21 (Munsell code 7.5YR 7/4)		
* 1 Position of Ear at Dry Husk Stage: 1=Upright 2=Horizontal 3=Pendent			1		
2 Husk Tightness (Rate on scale from 1=very loose to 9=very tight)			5		
2 Husk Extension (at harvest): 1=Short (ears exposed) 2=Medium (<8 cm) 3=Long (8-10 cm beyond ear tip) 4=Very Long (>10 cm)			1		
7b. EAR (Husked Ear Data):	Standard Deviation	Sample Size		Standard Deviation	Sample Size
* 14.7 cm Ear Length	2.08	50	13.9	2.10	50
* 38.3 mm Ear Diameter at mid-point	1.40	50	37.8	2.40	50
84.6 gm Ear Weight	16.58	50	65.2	17.92	50
* 14 Number of Kernel Rows	1.92	50	13	1.50	50
SMS 8/1/97 2 1 Kernel Rows: 1=Indistinct 2=Distinct			2		
1 Row Alignment: 1=Straight 2=Slightly Curved 3=Spiral			1		
15.4 cm Shank Length	3.74	50	9.9	2.10	50
2 Ear Taper: 1=Slight 2=Average 3=Extreme			2		
Application Variety Data			Standard Inbred Data		

Note: Use chart on first page to choose color codes for color traits.

8. KERNEL (Dried):	Standard Deviation	Sample Size	Standard Deviation	Sample Si.
10.4 mm Kernel Length	.54	50	10.2 1.00	50
8.2 mm Kernel Width	.64	50	8.6 .74	50
4.9 mm Kernel Thickness	.76	50	5.2 .89	50
29.1 % Round Kernels (Shape Grade)	4.03	15	32.8 6.49	15
1 Aleurone Color Pattern: 1=Homozygous 2=Segregating			1	
(*) 19 Aleurone Color (Munsell code 2.5Y 8/2)			19 (Munsell code 2.5Y 8/2)	
* 07 Hard Endosperm Color (Munsell code 2.5Y 5/6)			07 (Munsell code 2.5Y 6/8)	
* 03 Endosperm Type: 1=Sweet (su1) 2=Extra Sweet (sh2) 3=Normal Starch 4=High Amylose Starch 5=Waxy Starch 6=High Protein 7=High Lysine 8=Super Sweet (se) 9=High Oil 10=Other			03	
19.2 gm Weight per 100 Kernels (unsized sample)	.46	15	23.0 1.00	15

9. COB:	Standard Deviation	Sample Size	Standard Devaition	Sample Siz
* 30.7 mm Cob Diameter at mid-point	1.40	50	30.2 2.10	50
14 Cob Color (Munsell code 10R 5/6)			19 (Munsell code 2.5Y 8/2)	

10. DISEASE RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested; leave Race or Strain Options blank if polygenic):

A. Leaf Blights, Wilts, and Local Infection Diseases	
__ Anthracnose Leaf Blight (*Colletotrichum graminicola*)	__
__ Common Rust (*Puccinia sorghi*)	__
__ Common Smut (*Ustilago maydis*)	__
5 Eyespot (*Kabatiella zeae*)	__
__ Goss's Wilt (*Clavibacter michiganense* spp. *nebraskense*)	__
8 Gray Leaf Spot (*Cercospora zeae-maydis*)	__
__ Helminthosporium Leaf Spot (*Bipolaris zeicola*) Race ____	__ Race ____
__ Northern Leaf Blight (*Exserohilum turcicum*) Race ____	__ Race ____
3 Southern Leaf Blight (*Bipolaris maydis*) Race ____	__ Race ____
__ Southern Rust (*Puccinia polysora*)	__
__ Stewart's Wilt (*Erwinia stewartii*)	__
5 Other (Specify) NORTHERN LEA SPOT RACE 3 (H. CARBONUM)	__
B. Systemic Diseases	
__ Corn Lethal Necrosis (MCMV and MDMV)	__
__ Head Smut (*Sphacelotheca reiliana*)	__
__ Maize Chlorotic Dwarf Virus (MCDV)	__
__ Maize Chlorotic Mottle Virus (MCMV)	__
__ Maize Dwarf Mosaic Virus (MDMV) Strain ____	__ Strain ____
__ Sorghum Downy Mildew of Corn (*Peronosclerospora sorghi*)	__
__ Other (Specify) ____	__
C. Stalk Rots	
__ Anthracnose Stalk Rot (*Colletotrichum graminicola*)	__
__ Diplodia Stalk Rot (*Stenocarpella maydis*)	__
__ Fusarium Stalk Rot (*Fusarium moniliforme*)	__
__ Gibberella Stalk Rot (*Gibberella zeae*)	__
__ Other (Specify) ____	__
D. Ear and Kernel Rots	
__ Aspergillus Ear and Kernel Rot (*Aspergillus flavus*)	__
__ Diplodia Ear Rot (*Stenocarpella maydis*)	__
__ Fusarium Ear and Kernel Rot (*Fusarium moniliforme*)	__
__ Gibberella Ear Rot (*Gibberella zeae*)	__
__ Other (Specify) ____	__

Note: Use chart on first page to choose color codes for color traits.

Application Variety Data	Page 4	Standard Inbred Data	960009

11. INSECT RESISTANCE (Rate from 1 (most susceptible) to 9 (most resistant); leave blank if not tested):

	Standard Deviation	Sample Size		Standard Deviation	Sample Size
__ Banks Grass Mite (*Oligonychus pratensis*)			__		
Corn Earworm (*Helicoverpa zea*)					
__ Leaf-Feeding			__		
Silk Feeding :					
__ __ __.__ mg larval wt.	_____	_____	__ __ __.__	_____	_____
__ Ear Damage			__		
__ Corn Leaf Aphid (*Rhopalosiphum maidis*)			__		
__ Corn Sap Beetle (*Carpophilus dimidiatus*)			__		
European Corn Borer (*Ostrinia nubilalis*)					
__ 1st Generation (Typically Whorl Leaf Feeding)					
__ 2nd Generation (Typically Leaf Sheath-Collar Feeding)			__		
Stalk Tunneling :			__		
__ __ __.__ cm tunneled/plant	_____	_____	__ __ __.__	_____	_____
Fall Armyworm (*Spodoptera frugiperda*)			__		
__ Leaf-Feeding			__		
Silk-Feeding :					
__ __ __.__ mg larval wt.	_____	_____	__ __ __.__	_____	_____
__ Maize Weevil (*Sitophilus zeamaize*)			__		
__ Northern Rootworm (*Diabrotica barberi*)			__		
__ Southern Rootworm (*Diabrotica undecimpunctata*)			__		
Southwestern Corn Borer (*Diatraea grandiosella*)					
__ Leaf Feeding			__		
Stalk Tunneling :					
__ __ __.__ cm tunneled/plant	_____	_____	__ __ __.__	_____	_____
__ Two-spotted Spider Mite (*Tetranychus urticae*)			__		
__ Western Rootworm (*Diabrotica virgifera virgifera*)			__		
__ Other (Specify) _____			__ _____		

12. AGRONOMIC TRAITS:

7 Stay Green (at 65 days after anthesis) (Rate on a scale from 1=worst to 9=excellent.)	5
__0.0__ % Dropped Ears (at 65 days after anthesis)	0.0
__0.0__ % Pre-anthesis Brittle Snapping	0.0
__0.0__ % Pre-anthesis Root Lodging	16.0
__0.0__ % Post-anthesis Root Lodging (at 65 days after anthesis)	0.0
__ __ __.__ Kg/ha Yield of Inbred Per Se (at 12-13% grain moisture)	__ __ __.__

13. MOLECULAR MARKERS: (0=data unavailable; 1=data available but not supplied; 2=data supplied)

0 Isozymes 0 RFLP's 0 RAPD's

REFERENCES:

Butler, D.R. 1954. A System for the Classification of Corn Inbred Lines. PhD Thesis, Ohio State University.
Emerson, R.A., G.W. Beadle, and A.C. Fraser. 1935. A Summary of Linkage Studies in Maize. Cornell A.E.S., Mem. 180.
Farr, D.F., G.F. Bills, G.P. Chamuris, A.Y. Rossman. 1989. Fungi on Plant and Plant Products in the United States. The American Phytopathological Society, St. Paul, MN.
Inglett, G.E. (Ed.) 1970. Corn: Culture, Processing, Products. Avi Publishing Company, Westport, CT.
Jugenheimer, R.W. 1976. Corn: Improvement, Seed Production, and Uses. John Wiley & Sons, New York.
McGee, D.C. 1988. Maize Diseases. APS Press, St. Paul, MN. 150 pp.
Munsell Color Chart for Plant Tissues. Macbeth. P.O. Box 230. Newburgh, N.Y. 12551-0230
The Mutants of Maize. 1968. Crop Science Society of America. Madison, WI.
Shurtleff, M.C. 1980. Compendium of Corn Diseases. APS Press, St. Paul, MN. 105 pp.
Sprague, G.F., and J.W. Dudley (Editors). 1988. Corn and Corn Improvement, Third Edition. Agronomy Monograph 18. ASA, CSSA, SSSA, Madison, WI.
Stringfield, G.H. Maize Inbred Lines of Ohio. Ohio A.E.S., Bul. 831. 1959.
U.S. Department of Agriculture. 1936, 1937. Yearbook.

COMMENTS (eg. state how heat units were calculated, standard inbred seed source, and/or where data was collected. Continue in Exhibit D):

$$GDD = \frac{Tmax + Tmin}{2} - 50°F$$

$Tmax \leq 86°F$
$Tmin \geq 50°F$

Seed Source: Iowa State University Data collected at Williamsburg, Iowa 1995

Additional Description of the Inbred

Exhibit D

LH178 is an early season field corn inbred line that flowers similar to 1 day earlier than LH85. It is a very good pollinator and has potential to be a seed parent in the northern corn belt.

LH178 combines well with many of the early B14's and earlier B73's and is high yielding for its maturity. In hybrid combinations, LH178 contributes excellent root strength and very good tolerance to Eyespot and Gray Leaf Spot.

REPRODUCE LOCALLY. *Include form number and date on all reproductions.* FORM APPROVED - OMB NO. 0581-0055 EXPIRES: 12-31-96

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY DIVISION - PLANT VARIETY PROTECTION OFFICE

EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)	2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER	3. VARIETY NAME
HOLDEN'S FOUNDATION SEEDS, INC.	Ex3509	LH178

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*	5. TELEPHONE *(include area code)*	6. FAX *(include area code)*
201 N. MAPLEWOOD AVENUE PO BOX 839 WILLIAMSBURG, IA 52361	(319) 668-1100	(319) 668-2453

7. PVPO NUMBER 9600095

8. Does the applicant own all rights to the variety? *Mark an "X" in appropriate block.* If no, please explain. [X] YES [ ] NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? [X] YES [ ] NO
If no, give name of country _____

10. Is the applicant the original breeder? If no, please answer the following: [X] YES [ ] NO

a. If original rights to variety were owned by individual(s):
Is (are) the original breeder(s) a U.S. national(s)? If no, give name of country _____

[ ] YES [ ] NO

b. If original rights to variety were owned by a company:
Is the original breeder(s) U.S. based company? If no, give name of country _____

11. Additional explantion on ownership *(If needed, use reverse for extra space):*

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original breeder, both the original breeder and the applicant must meet one of the above criteria.

The original breeder may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.

Statement of the Basis of Applicant Ownership

Exhibit E

Holden's Foundation Seeds, Inc., Williamsburg, Iowa, is the sole owner and breeder of the LH178 field corn inbred line for which it solicits a certificate of protection.